



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,186	12/07/2001	Sadeg M. Faris	Reveo-0153USAOON00	6324
26665	7590	12/01/2004	EXAMINER	
REVEO, INC. 3 WESTCHESTER PLAZA ELMSFORD, NY 10523			CHIN, PAUL T	
			ART UNIT	PAPER NUMBER
			3652	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/017,186

Applicant(s)

FARIS, SADEG M. 56

Examiner

PAUL T. CHIN

Art Unit

3652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9 and 16-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

---

**DETAILED ACTION**

1. Applicant's amendment filed August 18, 2004, and the arguments presented therewith have been fully considered but they are not persuasive. Applicant's amendment (the additions of new limitations to claims 1 and 16 in combination with other structural limitations) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1,2,4-6,8, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Bhandarkar et al. (5,967,577).

Bhandarkar et al. (5,967,577) discloses a handler for picking up an object, comprising a body (Fig. 3) having a plurality of openings including a holding surface level and a suction level, wherein the openings (54,54) at the suction level are larger than the openings (42,42) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level, and a compressed air container (72), or an epoxy container, a

---

conduit (70), and a controller (Col 5, lines 16-27), which are a vacuum source creating a pressure force, attached to the body at the suction surface level.

Re claim 2, Bhandarkar et al.' handler (5,967,577) shows that the numbers of the openings (42,42) at the holding surface is greater than the numbers of the openings (54,54) at the suction surface level.

Re claims 4-6, Bhandarkar et al.' handler (5,967,577) further shows at least one intermediate level between the holding surface and the suction surface levels wherein the openings (50,50, or 52,52) of the intermediate level are larger than the openings (42,42) of the holding surface level and smaller than the openings (54,54) of the suction surface level. Similarly, the numbers of the openings (50,50, or 52,52) at the intermediate level is greater than the numbers of the openings at the suction surface level.

Re claim 8, Bhandarkar et al.' handler (5,967,577) shows the walls and baffles are formed of metal, aluminum (see Col 4, lines 29-35).

Re claim 16, further shows a handler body having a thickness (see Fig. 3) and a vacuum source (74). It is pointed out that Bhandarkar et al.' handler (5,967,577) contains all the structural elements as recited in the above claims while the intended use or the functional limitation (i.e. suitable for holding fragile objects) is not patentably significant.

4. Claims 1,2,4-8, and 16, are rejected under 35 U.S.C. 102(e) as being anticipated by Nagaoka (6,336,492).

Nagaoka (6,336,492) discloses a handler for applying vacuum holding force to an object, comprising a body (Fig. 5) having a plurality of openings (27,25, 10a) including a holding surface level and a suction level, wherein the openings (427), (25,25), or openings on

the plate (28) at the suction level are larger than the openings (10a, 10a) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level, and a vacuum source (3) (see Fig. 3), which is an electric piston operation unit (see Col 4, lines 59-64), creating a pressure force, being attached to the body at the suction surface level.

Re claim 2, Nagaoka's handler (6,336,492) shows that the numbers of the openings (10a, 10a) at the holding surface is greater than the numbers of the openings ((25p25), or openings on the plate (28)) at the suction surface level.

Re claims 4-6, Nagaoka's handler (6,336,492) further shows at least one intermediate level between the holding surface and the suction surface levels wherein the openings (25,25) of the intermediate level are larger than the openings (10a, 10a) of the holding surface level and smaller than the openings (located on the plate 28) (see Fig. 5) of the suction surface level. Similarly, the numbers of the openings (25,25) at the intermediate level is greater than the numbers of the openings located on the plate (28) (see Fig. 5) at the suction surface level.

Re claim 7, Nagaoka's handler (6,336,492) further shows a valve (29) (see Fig. 5) in the one opening ((27) or (one of the openings at plate 28) of the openings to control the fluid flow.

Re claim 8, Nagaoka's handler (6,336,492) shows the central chamber (12) is being made of metal (see Col 5, lines 18-29).

Re claim 16, Nagaoka's handler (6,336,492) further shows a handler body having a

thickness (see Fig. 5) and a vacuum source (3) (see Fig. 3), which is an electric piston operation unit (see Col 4, lines 59-64), creating a pressure force, being attached to the body at the suction surface level.

5. Claims 1,2,4-6,8, and 16, are rejected under 35 U.S.C. 102(b) as being anticipated by Lovegrove (2,572,640) (see PTO-892, paper No. 4).

Lovegrove (2,572,640) discloses a handler for applying vacuum holding force to a fragile object (19), comprising a body (Fig. 2) having a plurality of openings including a holding surface level and a suction level, wherein the openings (22,22 or 24,24) at the suction level are larger than the openings (18,18, or 14, 14) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level. It is pointed out that Lovegrove (2,572,640) also discloses a vacuum source (not shown) (see Col 5, lines 10-20) attached to the handle body (see Fig. 2) through a hose (30) at the suction surface level, Re claim 2, Lovegrove (2,572,640) shows that the numbers of the openings (14, 14 or 18, 18) at the holding surface is greater than the numbers of the openings (22,22), or openings on the plate (20,23) at the suction surface level.

Re claims 4-6 and 16, Lovegrove's handling device (2,572,640) further shows at least one intermediate level (20) between the holding surface and the suction surface levels wherein the openings (22,22) (see Fig. 1) of the intermediate level are larger than the openings (14,14,18,18) (Fig. 2) of the holding surface level and smaller than the openings (24,24) of the suction surface level. Similarly, the frequency of the openings (22,22) at the intermediate level is greater than the numbers of the openings (24,24) at the suction surface level.

Re claim 8, Lovegrove's handling device (2,572,640) is being made of lightweight metal (Col 1, lines 22-32).

6. Claims 1,8, and 16, are rejected under 35 U.S.C. 102(b) as being anticipated by Bush et al. (4,773,687).

Bush et al. (4,773,687) discloses a handler for applying vacuum holding force to a fragile object (113), comprising a body (Fig. 3) having a plurality of openings including a holding surface level and a suction level, wherein the openings (107,102) (see Fig. 3) at the suction level are larger than the openings (105,106) (Fig. 2) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level. It is pointed out that Bush et al. (4,773,687) also discloses a vacuum source (see Fig. 3) attached to the handle body through openings (102,107) at the suction surface level,

Re claim 2, Lovegrove (2,572,640) shows that the numbers of the openings (14, 14 or 18, 18) at the holding surface is greater than the numbers of the openings (22,22), or openings on the plate (20,23) at the suction surface level.

Re claim 8, Bush et al. (4,773,687) is being made of lightweight metal, aluminum (Col 3, lines 36-41).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhandarkar et al.' handler (5,967,577) in view of Tsuji (5,564,682).

Bhandarkar et al.' handler (5,967,577), as presented in section 3 above, does not clearly show at least one micro-mechanical valve in the at least one of the openings. However, Tsuji (5,564,682) shows a wafer chuck having a plurality of wafer ports or openings (23,30) (Fig. 6) wherein at least one mechanical valve (31,32) is provided on at least one of the vacuum ports or openings (30,30) to control the fluid flow.

Accordingly, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to provide a mechanical valve or a micro-mechanical valve on the at least one of the openings of Bhandarkar et al.' handler (5,967,577) as taught by Tsuji (5,564,682) in order to manageably control the fluid flow.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhandarkar et al.' handler (5,967,577) in view of Ogawa (4,858,975).

Bhandarkar et al.' handler (5,967,577), as presented in section 3 above, is used to pick up solder balls, but does not show the handler is being made of a semiconductor material (from the group consisting of silicon, III-V type semiconductors, II-IV type semiconductors, II-VI type semiconductor, IV-VI type semiconductors, Ge, C, Si-oxide, Si-nitride, and at least one of the foregoing materials).

However, Ogawa (4,858,975) shows a wafer holder (27) being made of silicon for etching process (Col 6, lines 60-68). Accordingly, it would have been obvious design material choice on the body of Bhandarkar et al.' handler (5,967,577) being formed of a well known material, silicon, as taught by Ogawa (4,858,975) for etching process and also to grip a well known silicon wafer.



10. Claim 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhandarkar et al.' handler (5,967,577).

Bhandarkar et al.' handler (5,967,577), as presented in section 3 above, does not clearly show that the ratio of the handler body thickness (Fig. 3) to the holding surface hole diameter (42) is about  $10^7$  to about  $10^2$  or  $10^6$  to about  $10^4$ , or  $10^5$  to  $10^4$ . However, it would have been an obvious design choice to those skilled in the art to provide the desired ratio as listed above on the Bhandarkar et al.' handler (5,967,577) in order to manageably control the desired fluid flow.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaoka's handler (6,336,492) or Lovegrove (2,572,640) in view of Ogawa (4,858,975).

Nagaoka's handler (6,336,492), as presented in section 4 above, or Lovegrove's device (2,572,640), presented in section 5 above, does not show that the body is formed of a semiconductor material (from the group consisting of silicon, III-V type semiconductors, II-V type semiconductors, II-VI type semiconductor, IV-VI type semiconductors, Ge, C, Si-oxide, Si-nitride, and at least one of the foregoing materials).

However, Ogawa (4,858,975) shows a wafer holder (27) being made of silicon for etching process (Col 6, lines 60-68). Accordingly, it would have been obvious design material choice on the body of Nagaoka's handler (6,336,492) or Lovegrove (2,572,640) being formed of a well known material, silicon, as taught by Ogawa (4,858,975) for etching process and also to grip a well known silicon wafer.

12. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaoka's handler (6,336,492) or Lovegrove (2,572,640) or Bush et al. (4,773,687)

Nagaoka's handler (6,336,492) or Lovegrove (2,572,640) or Bush et al. (4,773,687) still does not show that the ratio of the handler body thickness (Fig. 3) to holding surface hole is about  $10^7$  to about  $10^2$  or  $10^6$  to about  $10^4$ , or  $10^5$  to  $10^4$ . However, it would have been obvious design choice to those skilled in the art to provide the desired ratio as listed above on the Nagaoka's handler (6,336,492) or Lovegrove (2,572,640) or Bush et al. (4,773,687) in order to manageably control the flow of the fluid.

***Response to Arguments***

13. Applicant's arguments filed February 24, 2004, have been fully considered but they are not persuasive. Applicant's basic arguments are similar to the arguments, presented on January 29, 2004 (pages 8-11), and the examiner had already explained and answered in the previous office action.

**Bhandarkar's device**

Applicant argues on page 9 that "the Bhandarkar is directed to a dispenser used for dispensing fluids. There is no teaching or suggestion in Bhandarkar to use a vacuum holding force or even mention of a vacuum handling fragile material."

In response to applicant's arguments, the recitation "for applying a vacuum holding force to an object", has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural

limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15

---

(CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Moreover, in response to applicant's argument of the intended use "for applying a vacuum holding force", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

It is pointed out that the Bhandarkar is capable of "picking up and place objects such as solder balls" (see abstract). Moreover, the devices discloses

"the improved air (or other fluid) flow in chamber 32" (Col 5, line 13-14),

"a source of fluid 72, such as a compressed air container ..... When a negative pressure is applied, fluid (including air) will flow in the opposite direction" (Col 5, lines 16-27), and

"When used as a tool to pick and place solder balls ..... " (Col 5, lines 36-42).

Bhandarkar's device is used to pick up solder balls and is also called a dispenser for providing homogeneous flow of fluid through the outlet ports (see abstract). It is noted that the word "fluid" can be defined as "a continuous, amorphous substance whose molecules move freely past one another and that has the tendency to assume the shape of its container, a liquid or gas" according to The American Heritage@ Dictionary of the English Language, Third Edition. In other word, "air" is also called "fluid" in mechanical engineering term and the fluid is not necessary to be a liquid as applicant argues.

---

Moreover, Bhandarkar's device also shows that when a negative pressure is applied, fluid will flow in the opposite direction, namely, out of the chamber (32) and into container" (Col 5, lines 13-27) creating a vacuum and providing a vacuum force on the object. Further, it is pointed out that Bhandarkar et al.' handler (5,967,577) contains all the structural elements as recited in the above claims while the intended use or the functional limitation (i.e. suitable for holding fragile object) is not patentably significant. Moreover, the argument on the combination of Bhandarkar et al.' handler (5,967,577) and Tsuji (5,564,682) is not persuasive. Tsuji (5,564,682) shows a wafer chuck having a plurality of wafer ports or openings (23,30) (Fig. 6) wherein at least one mechanical valve (31,32) is provided on at least one of the vacuum ports or openings (30,30) to control the fluid flow. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a mechanical valve of a micro-mechanical valve on the at least one of the openings of Bhandarkar et al.' Handler (5,967,577) as taught by Tsuji (5,564,682) in order to manageably control the fluid flow providing a valve on the passageway of vacuum port to close or open is well known in the art in the semiconductor industries to control the fluid flow.

**Nazoaka (6,336,492)**

Applicant argues that "Nagoaka (6,336,492) has no more than one opening (27) in the chamber (12)". The argument is not persuasive. Nagoaka (6,336,492) discloses a body (Fig. 5) having a plurality of openings (27,25,10a) including a holding surface level and a suction level, wherein the openings ((27), (25,25), or openings on the plate (28)) at the suction level are larger than the openings (10a, 10a) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level. The reference also discloses a

valve (29) (Fig. 5) movable in the chamber (12a) creating two sub-chambers, which can be considered as openings, each opening is larger than the lower openings (25,25). Moreover, there are openings on the plate (28) as shown in figure 5. Therefore, Nagoaka (6,336,492), as broadly recited, meets the structural limitations.

**Lovegrove (2,572,640)**

Applicant argues that "Lovegrove (2,572,640) does not teach or suggest that the channels at a "surface level" are larger than the channel at the holding level". The argument is not persuasive. The prior art shows at least one intermediate level (20) between the holding surface and the suction surface levels wherein the openings (22,22) (see Fig. 1) of the intermediate level are larger than the openings (14,14,18,18) (Fig. 2) of the holding surface level and smaller than the openings (24,24) of the suction surface level. Similarly, the frequency of the openings (22,22) at the intermediate level is greater than the numbers of the openings (24,24) at the suction surface level. Therefore, the reference, Nagoaka (6,336,492) meets the structural limitations.

***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Applicant's amendment (the additions of new limitations to claims 1 and 16 in combination with other structural limitations) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL T. CHIN whose telephone number is (703) 305-1524. The examiner can normally be reached on MON-THURS (7:30 -6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, EILEEN LILLIS can be reached on (703) 308-3248. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pte

PTC  
November 23, 2004



EILEEN D. LILLIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600